Access DB# 145153

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: TRIVEDI, DIVC Examiner # : 69332 Date: Feb 14, 2005
Art Unit: 1711 Phone Number 30 2 - 1681 Serial Number: 10/825,799
Mail Box and Bldg/Room Location: 10271 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: _____

Inventors (please provide full names): _____

_____

Earliest Priority Filing Date: _____

**For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

General formula of claim 21, specific formula of claims 25 and 26. Thanks.

****

STAFF USE ONLY **Type of Search** **Vendors and cost where applicable**

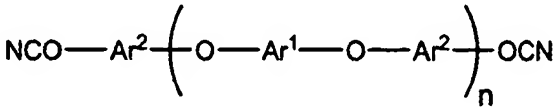
19. The process of claim 17, wherein n is from 1 to 10.

20. The process of claim 6,

wherein an excess of dihydroxyaromatic compound is used; and

further comprising the step of reacting the product of reacting the dihydroxyaromatic compound with the dihaloaromatic compound with a hydroxyaromatic in the presence of a copper compound and a base other than cesium carbonate.

21. A cyanate ester comprising the formula:



wherein Ar^1 and Ar^2 are independently selected divalent aromatic radicals selected from the group consisting of a substituted or unsubstituted aromatic ring, substituted or unsubstituted fused aromatic rings, a substituted or unsubstituted aromatic ring assembly with or without intervening groups, and combinations thereof, with the proviso that when Ar^2 is a bisphenol A residue, then Ar^1 is neither a benzophenone residue nor a diphenyl sulfone residue; and

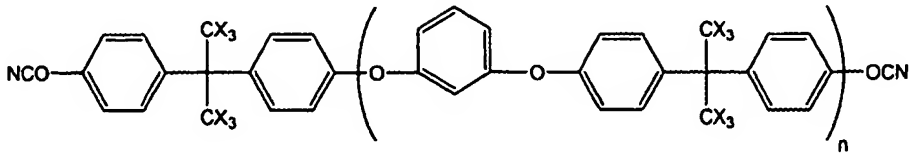
wherein n is a positive integer.

22. The cyanate ester of claim 21, wherein Ar^1 is selected from the group consisting of a phenyl, an m-phenyl, p-phenyl, o-phenyl, a benzophenone residue, a 4,4'-benzophenone residue, and a diphenyl sulfone residue.

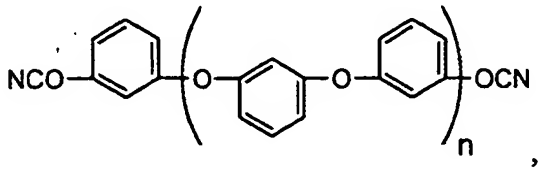
23. The cyanate ester of claim 21, wherein Ar^2 is selected from the group consisting of a phenyl, an m-phenyl, a biphenyl, a 4,4'-biphenyl, and a bisphenol residue.

24. The cyanate ester of claim 21, wherein n is from 1 to 10.

25. The cyanate ester of claim 21, wherein the cyanate ester is selected from the group consisting of:



wherein each X is independently selected from the group consisting of H and F,



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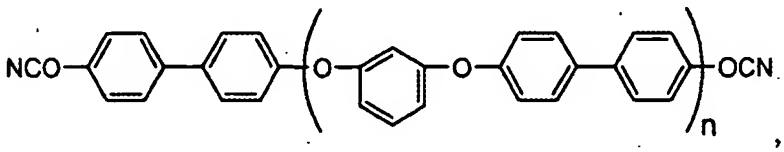

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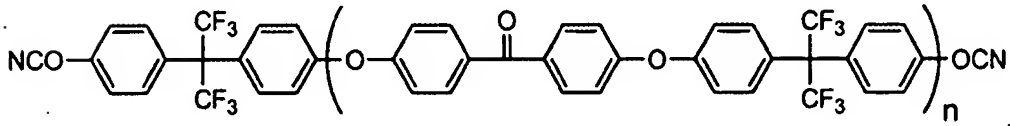
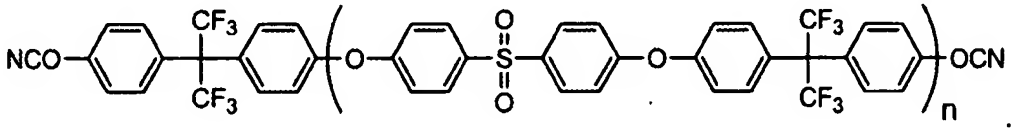
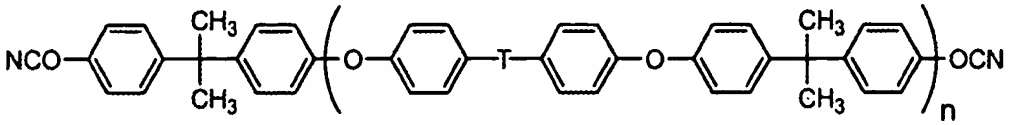
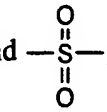


, and



26. A cyanate ester comprising the formula:



wherein T is selected from the group consisting of  and  ; and

wherein n is a positive integer from 1 to 5.

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Bib Data Sheet

CONFIRMATION NO. 9097

SERIAL NUMBER	FILING DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
10/825,799	04/14/2004 RULE	528	1711	NC 84,981

APPLICANTS

Teddy M. Keller, Fairfax Station, VA;

Matt Laskoski, Alexandria, VA;

** CONTINUING DATA **********

This appln claims benefit of 60/529,240 12/15/2003

** FOREIGN APPLICATIONS **********

Foreign Priority claimed	35 USC 119 (a-d) conditions met	Verified and Acknowledged	STATE OR COUNTRY	SHEETS DRAWING	TOTAL CLAIMS	INDEPENDENT CLAIMS
☐ yes ☑ no	☐ yes ☑ no ☐ Met after Allowance	Examiner's Signature / Initials	VA	2	36	7

ADDRESS
26384
NAVAL RESEARCH LABORATORY
ASSOCIATE COUNSEL (PATENTS)
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4555 OVERLOOK AVENUE, S.W.
WASHINGTON , DC
20375-5320

TITLE
Synthesis of oligomeric cyanate esters

FILING FEE	FEES: Authority has been given in Paper	☐ All Fees
RECEIVED 1402	No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:	☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue)

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     FILE 'HCAPLUS'
L1        16966 S KELLER ?/AU
L2           27 S LASKOSKI ?/AU
L3            4 S L1 AND L2
                SEL L3 1-4 RN

     FILE 'REGISTRY'
L4            9 S E1-E9
                E POLYCYANURATE/PCT
L5         1227 S E3
L6            0 S L4 AND L5
L7            7 S L4 AND PMS/CI

     FILE 'HCAPLUS'
L8          522 S KELLER T?/AU
L9        17610 S ?CYANURAT?
L10           1 S L8 AND L9
L11           1 S L2 AND L9
L12           1 S L10 AND L11
                SEL L12 1 RN

     FILE 'REGISTRY'
L13           5 S E1-E5
                E POLYETHER/PCT
L14      254275 S E3
                E POLYKETONE/PCT
L15       18318 S E3
                E POLYSULFONE/PCT
L16       15830 S E3
L17         386 S L5 AND L14
L18           5 S L17 AND L15
L19          23 S L17 AND L16
                SEL L19 1,3,5,6,7,8,15,18,23 RN
L20           9 S E1-E9
L21           5 POLYLINK L18
L22           9 POLYLINK L20
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L24          16 S L22

     FILE 'LREGISTRY'
L25             STR

     FILE 'REGISTRY'
L26             SCR 1199
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L27      170277 S E3
                E POLYACRYLIC/PCT
L28      302893 S E3
L29         267 S L17 NOT (L27 OR L28)
L30          12 S L25 NOT L26 SSS SAM SUB=L29
L31             STR
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L33         208 S (L25 NOT L31) NOT L26 SSS FUL SUB=L29
                SAV L33 TRU799/A
L34             STR
L35             STR
L36           2 S L34 SSS SAM SUB=L33
L37          16 S L33 AND F/ELS
L38         204 S L33 NOT 2<N
L39          15 S L37 AND L38
                SEL L39 3,6,9,10 RN
L40           4 S E1-E4
L41           2 S L40 NOT (L21 OR L22)

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     FILE 'LREGISTRY'
L43             STR

     FILE 'REGISTRY'
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L45           6 S L35 SSS SAM SUB=L33
L46         154 S L35 SSS FUL SUB=L33
                SAV L46 TRU799A/A
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L48          34 S (L34 OR L43) SSS FUL SUB=L33
                SAV L48 TRU799B/A
L49          10 S L46 AND L48
                E EPOXY RESIN/PCT
L50       45495 S E3
L51          86 S L33 NOT L50
L52           6 S L51 AND L49
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L54             0 S L53 NOT (L21 OR L22 OR L41)

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L55             6 S L53

     FILE 'REGISTRY'
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L57             4 POLYLINK L53

     FILE 'HCAPLUS'
L58             3 S L56
L59             6 S L57

     FILE 'REGISTRY'
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L61             0 S L51 AND SRU
L62            12 S L60 NOT (L21 OR L22 OR L41 OR L53)
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                  SEL L63 2,3,5,6,8,10,11,12 RN
L64             8 S E5-E12

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L66            24 S L23 OR L24 OR L42 OR L55 OR L58 OR L59 OR L65

     FILE 'REGISTRY'


=> d 146 que stat
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L14       254275 SEA FILE=REGISTRY POLYETHER/PCT
L17          386 SEA FILE=REGISTRY L5 AND L14
L25              STR
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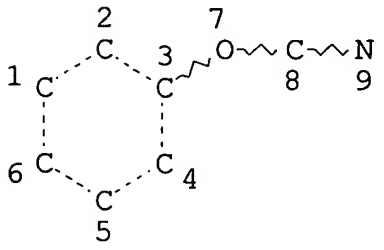


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CONNECT IS E2  RC AT   8
CONNECT IS E1  RC AT   9
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DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 9

STEREO ATTRIBUTES: NONE
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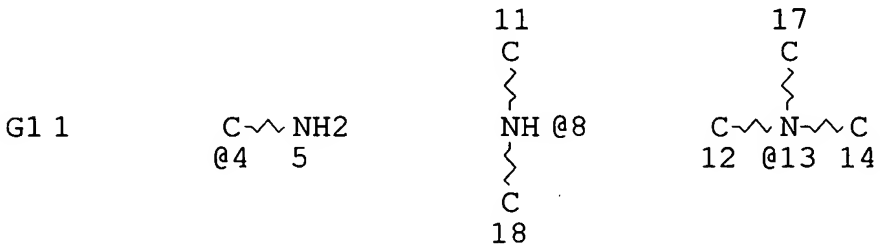
L27 170277 SEA FILE=REGISTRY POLYVINYL/PCT
L28 302893 SEA FILE=REGISTRY POLYACRYLIC/PCT
L29 267 SEA FILE=REGISTRY L17 NOT (L27 OR L28)
L31 STR



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NSPEC IS RC AT 4
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NSPEC IS RC AT 12
NSPEC IS RC AT 14
NSPEC IS RC AT 17
NSPEC IS RC AT 18
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
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STEREO ATTRIBUTES: NONE
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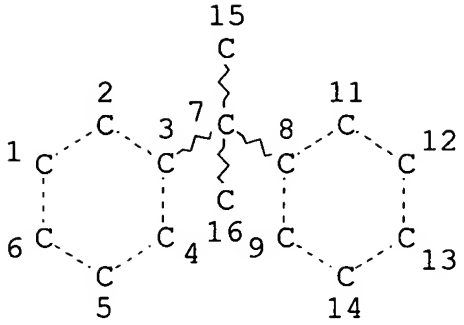
L35 STR



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DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
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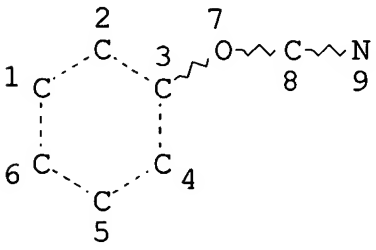
NUMBER OF NODES IS 15

STEREO ATTRIBUTES: NONE
L46 154 SEA FILE=REGISTRY SUB=L33 SSS FUL L35

100.0% PROCESSED 156 ITERATIONS 154 ANSWERS
SEARCH TIME: 00.00.01

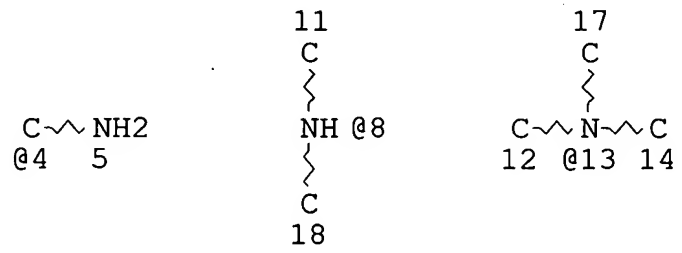
=> d l48 que stat
L5 1227 SEA FILE=REGISTRY POLYCYANURATE/PCT
L14 254275 SEA FILE=REGISTRY POLYETHER/PCT
L17 386 SEA FILE=REGISTRY L5 AND L14
L25 STR



NODE ATTRIBUTES:
CONNECT IS E2 RC AT 8
CONNECT IS E1 RC AT 9
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 9

STEREO ATTRIBUTES: NONE
L26 SCR 1199
L27 170277 SEA FILE=REGISTRY POLYVINYL/PCT
L28 302893 SEA FILE=REGISTRY POLYACRYLIC/PCT
L29 267 SEA FILE=REGISTRY L17 NOT (L27 OR L28)
L31 STR



VAR G1=4/8/13
NODE ATTRIBUTES:
NSPEC IS RC AT 4
NSPEC IS RC AT 11
NSPEC IS RC AT 12
NSPEC IS RC AT 14
NSPEC IS RC AT 17
NSPEC IS RC AT 18
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 10

STEREO ATTRIBUTES: NONE
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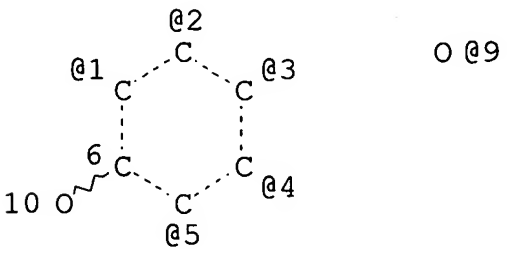
L34 STR



VPA 9-5/4/3/2/1 U

NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 8

STEREO ATTRIBUTES: NONE
L43 STR

Cb—O—Cb
1 2 3

NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
GGCAT IS UNS AT 1
GGCAT IS UNS AT 3
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 3

STEREO ATTRIBUTES: NONE
L48 34 SEA FILE=REGISTRY SUB=L33 SSS FUL (L34 OR L43)

100.0% PROCESSED 208 ITERATIONS 34 ANSWERS
SEARCH TIME: 00.00.01

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=> d l66 1-24 cbib abs hitstr hitrn

L66 ANSWER 1 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
2004:452268 Document No. 141:191327 Chemorheological studies on a dicyanate resin modified with polyethersulfone. Hong, Bong Taek; Roh, Seung Sang; Kim, Dae Su (Department of Chemical Engineering, Chungbuk National University, Cheongju, 361-763, S. Korea). Polymer International, 53(6), 640-645 (English) 2004. CODEN: PLYIEI. ISSN:

0959-8103. Publisher: John Wiley & Sons Ltd..

AB The chemorheol. of a dicyanate resin modified with a polyethersulfone (PES) was investigated. The rheol. and dielec. property changes during curing of the dicyanate resin system catalyzed by an org. metal salt were monitored by a rheometer and dielec. analyzer, resp., and used to investigate the curing behavior and chemorheol. of the resin system. The curing rate of the dicyanate resin system decreased as the PES content was increased. A function that can describe the viscosity change of the dicyanate resin system during curing was detd. by a nonlinear regression method using the rheometer data. The gelation time of the dicyanate resin system decreased with increasing isothermal curing temp. and with decreasing PES content. The curing behavior of the dicyanate resin system monitored by the dielec. analyzer coincided fairly well with that measured by the rheometer.

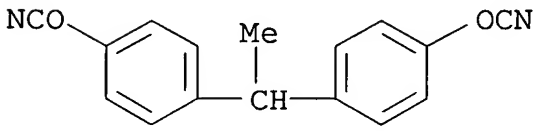
IT **736974-66-6**, Arocy L 10-4,4'-Dichlorodiphenyl sulfone-4,4'-dihydroxydiphenyl sulfone copolymer
(cured; chemorheol. and dielec. properties of dicyanate resin modified with poly(ether sulfone) during curing)

RN 736974-66-6 HCAPLUS

CN Cyanic acid, ethylidenedi-4,1-phenylene ester, polymer with 1,1'-sulfonylbis[4-chlorobenzene] and 4,4'-sulfonylbis[phenol] (9CI) (CA INDEX NAME)

CM 1

CRN 47073-92-7
CMF C16 H12 N2 O2



CM 2

CRN 80-09-1
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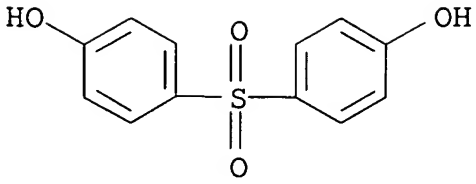
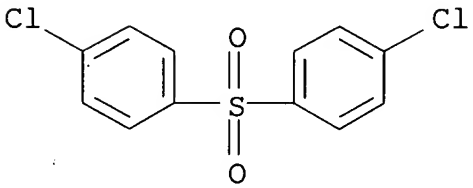


CM 3

CRN 80-07-9
CMF C12 H8 Cl2 O2 S



IT **736974-66-6**, Arocy L 10-4,4'-Dichlorodiphenyl sulfone-4,4'-dihydroxydiphenyl sulfone copolymer
(cured; chemorheol. and dielec. properties of dicyanate resin modified with poly(ether sulfone) during curing)

L66 ANSWER 2 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
2004:169049 Document No. 140:407245 Studies on a dicyanate containing four phenylene rings and polycyanurate copolymers. 3. Application of mathematical models to determine the kinetics of the thermal degradation processes. Hamerton, Ian; Emsley, Alan M.; Howlin, Brendan J.; Klewpatinond, Paul; Takeda, Shinji (Chemistry Division School of Biomedical and Molecular Sciences, University of Surrey, Surrey, GU2 7XH, UK). Polymer, 45(7), 2193-2199 (English) 2004. CODEN: POLMAG. ISSN: 0032-3861. Publisher: Elsevier Science Ltd..

AB Selected copolymers of bis-4-(4-cyanatophenoxy)phenyl sulfone with a com. dicyanate, 2,2-bis(4-cyanatophenyl)propane are analyzed using thermogravimetry to examine the processes of thermal degrdn. Kinetic treatment of the data from these thermal analyses yields three Arrhenius equations for each monomer individually. The kinetics are consistent with a three-stage degrdn. mechanism, but the total kinetics of the copolymers cannot be derived simply from the sum of the constituent parts added together in proportion to their concn. Each copolymer reacts slightly differently and must therefore be treated individually.

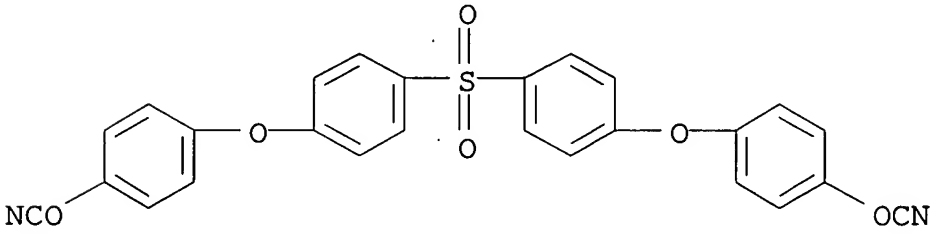
IT **42751-92-8**, Bis-4(4-cyanatophenoxy)phenyl sulfone

homopolymer **595584-80-8**, AroCy B 10-bis-4(4-cyanatophenoxy)phenyl sulfone copolymer
(application of math. models to det. kinetics of thermal degrdn. processes of dicyanate contg. four phenylene rings and polycyanurate copolymers)

RN 42751-92-8 HCAPLUS
CN Cyanic acid, sulfonylbis(4,1-phenyleneoxy-4,1-phenylene) ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 42592-24-5
CMF C26 H16 N2 O6 S



RN 595584-80-8 HCAPLUS
CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer with sulfonylbis(4,1-phenyleneoxy-4,1-phenylene) dicyanate (9CI) (CA INDEX NAME)

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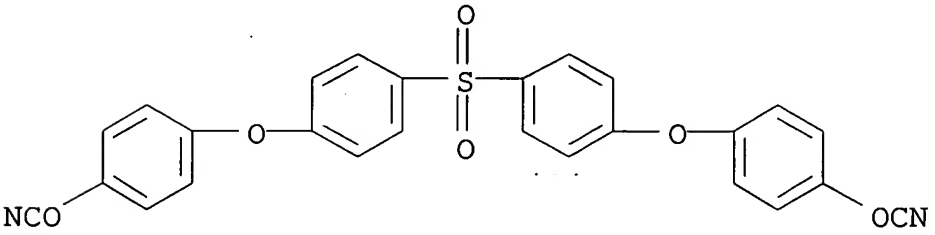
CRN 42592-24-5
CMF C26 H16 N2 O6 S



CM 2

CRN 1156-51-0

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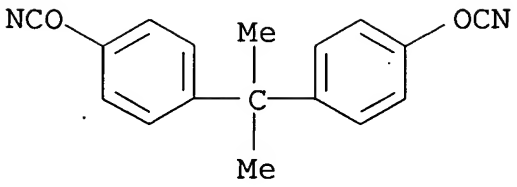
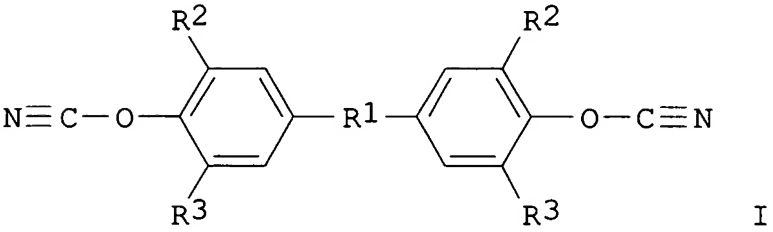


IT **42751-92-8**, Bis-4(4-cyanatophenoxy)phenyl sulfone homopolymer **595584-80-8**, AroCy B 10-bis-4(4-cyanatophenoxy)phenyl sulfone copolymer
(application of math. models to det. kinetics of thermal degrdn. processes of dicyanate contg. four phenylene rings and polycyanurate copolymers)

L66 ANSWER 3 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
2003:711647 Document No. 139:246640 Heat- and impact-resistant cyanate-crosslinkable resin composition and varnish using the composition for laminated circuit board. Sase, Shigeo; Mizuno, Yasuyuki; Fujimoto, Daisuke; Takeda, Shinji (Hitachi Chemical Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2003252989 A2 20030910, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2002-57432 20020304.

GI



I

AB The resin compn. contains a dicyanate having sulfone or polysiloxane structure I [R1 = OC6H4SO2C6H4O (all p-), C2H4(SiMe2O)nSiMe2C4H6, n = 20-70; R2, R3 = H, lower alkyl]. The varnish is that obtained by dissolving of the compn. in an org. solvent, which provides a laminated printed circuit board showing both good high frequency property and good impact resistance. Thus, 100 parts bis(4-cyanatophenyl-4'-phenoxy) sulfone was prepolymd. in the presence of Zn naphthenate in PhMe and mixed with Co naphthenate to

give the crosslinkable compn. Then, 4 glass cloths were impregnated with the compn. to give prepregs, which were laminated and sandwiched between Cu foils and pressed at 230.degree. for 120 min to give a Cu-clad laminated board showing peeling strength of the foil 1.2 kN/m, sp. dielec. const 3.8 at 1 MHz, and good heat cycle test resistance.

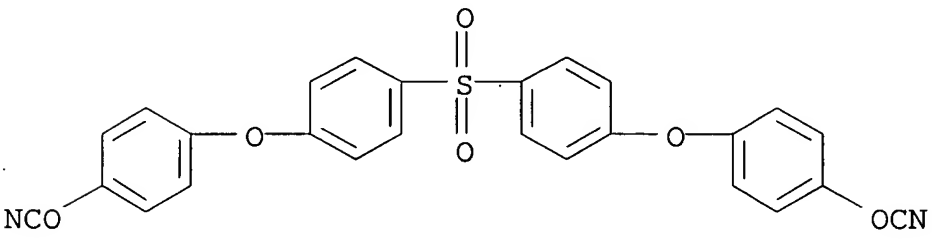
IT **42751-92-8P**
(cyanatè-crosslinkable resin compn. for laminated printed circuit board)

RN 42751-92-8 HCAPLUS

CN Cyanic acid, sulfonylbis(4,1-phenyleneoxy-4,1-phenylene) ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 42592-24-5
CMF C26 H16 N2 O6 S



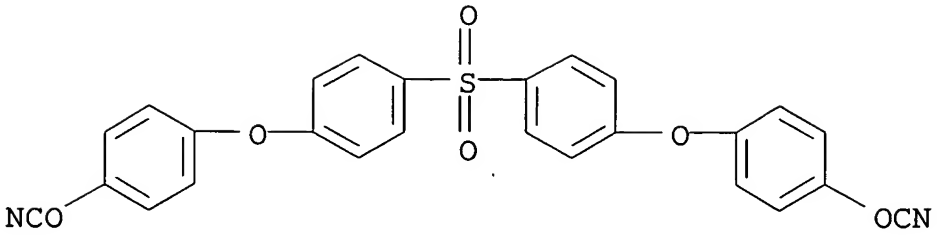
IT **595584-80-8**
(cyanate-crosslinkable resin compn. for laminated printed circuit board)

RN 595584-80-8 HCAPLUS

CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer with sulfonylbis(4,1-phenyleneoxy-4,1-phenylene) dicyanate (9CI) (CA INDEX NAME)

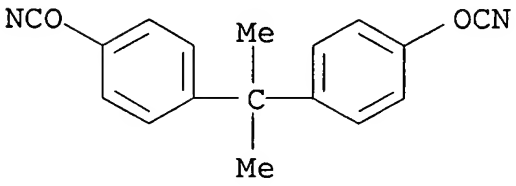
CM 1

CRN 42592-24-5
CMF C26 H16 N2 O6 S



CM 2

CRN 1156-51-0
CMF C17 H14 N2 O2



IT **42751-92-8P**
(cyanate-crosslinkable resin compn. for laminated printed circuit board)
IT **595584-80-8**
(cyanate-crosslinkable resin compn. for laminated printed circuit board)

L66 ANSWER 4 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
2003:560790 Document No. 139:246412 Studies on a dicyanate containing four phenylene rings and polycyanurate blends. 2. Application of mathematical models to the catalyzed polymerization process. Hamerton, Ian; Emsley, Alan M.; Howlin, Brendan J.; Klewpatinond, Paul; Takeda, Shinji (School of Biomedical and Life Sciences, Department of Chemistry, University of Surrey, Guildford, Surrey, GU2 7XH, UK). Polymer, 44(17), 4839-4852 (English) 2003. CODEN: POLMAG. ISSN: 0032-3861. Publisher: Elsevier Science Ltd..
AB Selected blends of bis-4-(4-cyanatophenoxy)phenyl sulfone with a com. dicyanate, 2,2-bis(4-cyanatophenyl)propane were analyzed using DSC to examine the processes of the Al-catalyzed thermal polymn. Kinetic treatment of these data showed that the kinetics of the formation of the bis-4-(4-cyanatophenoxy)phenyl sulfone homopolymer were fitted with just 2 processes, but 3 processes were required for the 2,2-bis(4-cyanatophenyl)propane homopolymer, for which a more complex thermogram was obtained. When considering the polymn.

kinetics of binary blends of the monomers it was necessary to select the min. no. of kinetic parameters to obtain the best fits to the data. The binary blends generally show trends in the data that reflect the monomer compn. The parameters derived from 2 kinetic methods are broadly in agreement; the kinetic treatment of the thermal data for 2,2-bis(4-cyanatophenyl)propane monomer suggests the presence of at least one impurity and this is supported by spectroscopic and chromatog. analyses. The latter was not obsd. for bis-4-(4-cyanatophenoxy)phenyl sulfone, a monomer found to be of a higher purity by chromatog. From the kinetic anal. of the thermal data (from dynamic DSC), the math. model predicts that, following an isothermal cure regime at 450 K, bis-4-(4-cyanatophenoxy)phenyl sulfone should reach a conversion of 90% after ca. 33 min. The empirical data for this isothermal expt. show that bis-4-(4-cyanatophenoxy)phenyl sulfone reaches a conversion of 73% after 33 min and 87% after 2 h at 450 K.

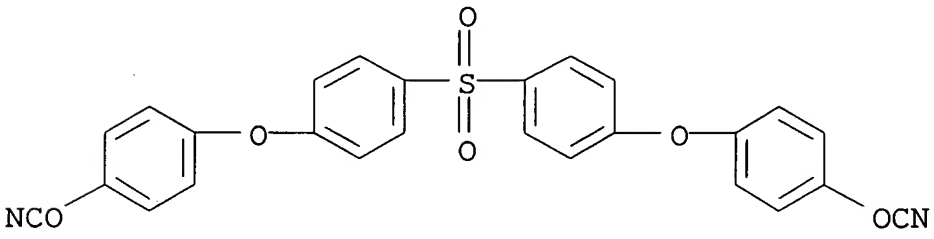
IT **42751-92-8**, Bis-4-(4-cyanatophenoxy)phenyl sulfone homopolymer
(simulation of aluminum-catalyzed thermal polymn. kinetics on a dicyanate contg. 4 phenylene rings and polycyanurate blends)

RN 42751-92-8 HCAPLUS

CN Cyanic acid, sulfonylbis(4,1-phenyleneoxy-4,1-phenylene) ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 42592-24-5
CMF C26 H16 N2 O6 S



IT **42751-92-8**, Bis-4-(4-cyanatophenoxy)phenyl sulfone homopolymer
(simulation of aluminum-catalyzed thermal polymn. kinetics on a dicyanate contg. 4 phenylene rings and polycyanurate blends)

L66 ANSWER 5 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN

2002:631120 Document No. 138:39665 Studies on a dicyanate containing four phenylene rings and polycyanurate blends. Part 1. Synthesis and polymerization of the monomers and characterization of the polymer

blends using thermal and mechanical methods. Hamerton, Ian; Howlin, Brendan J.; Klewpatinond, Paul; Takeda, Shinji (School of Physics and Chemistry, Department of Chemistry, University of Surrey, Surrey, Guildford, GU2 7XH, UK). Polymer, 43(21), 5737-5748 (English) 2002. CODEN: POLMAG. ISSN: 0032-3861. Publisher: Elsevier Science Ltd..

AB The two-step prepn. of bis-4-(4-cyanatophenoxy)phenyl sulfone, in good yield and high purity, is reported. Characterization of the monomer is undertaken using spectroscopic and chromatog. methods and elemental anal. Blends of bis-4-(4-cyanatophenoxy)phenyl sulfone with a com. dicyanate, 2,2-bis(4-cyanatophenyl)propane are analyzed using differential scanning calorimetry at a variety of heating rates and the thermal data compared with those of the discrete monomers. The cured homopolymers and blends are further analyzed using thermogravimetry, dynamic mech. thermal anal., and thermomech. anal. The effects of blend compn. on the thermal stability, glass transition temp., and thermal expansion are discussed.

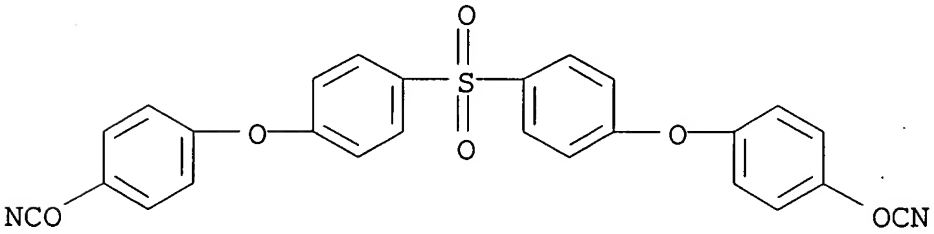
IT **42751-92-8P**
(prepn. and thermal and mech. properties of polycyanurate blends with polymers from bis(cyanatophenoxy)phenyl sulfone)

RN 42751-92-8 HCAPLUS

CN Cyanic acid, sulfonylbis(4,1-phenyleneoxy-4,1-phenylene) ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 42592-24-5
CMF C26 H16 N2 O6 S



IT **42751-92-8P**
(prepn. and thermal and mech. properties of polycyanurate blends with polymers from bis(cyanatophenoxy)phenyl sulfone)

L66 ANSWER 6 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN

2001:775046 Document No. 136:70601 Miscibility and kinetic behavior of cyanate resin/polysulfone blends. Recalde, Ileana B.; Campos, Agustin; Mondragon, Inaki; Gomez, Clara M. (Departament de Quimica Fisica and Institut de Ciencia dels Materials, Valencia, 46 100,

Spain). Macromolecular Symposia, 174(Polymerization Processes and Polymer Materials I), 175-185 (English) 2001. CODEN: MSYMEC. ISSN: 1022-1360. Publisher: Wiley-VCH Verlag GmbH.

AB A dicyanate ester resin was modified by blending with polysulfone (PSF) and cured at different temps. with or without cobalt catalyst. Size exclusion chromatog. was used to det. the cyanate conversion until the gel point. The morphol. of the cured samples, characterized by SEM, varied from PSF particle structure to a combined particle structure.

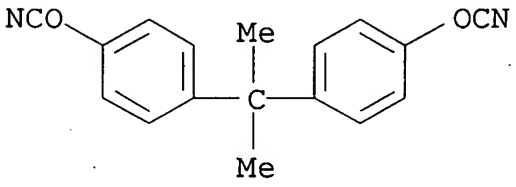
IT **279245-14-6**
(miscibility and kinetic behavior of cyanate resin/polysulfone blends)

RN 279245-14-6 HCAPLUS

CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer with 4,4'-(1-methylethylidene)bis[phenol] and 1,1'-sulfonylbis[4-chlorobenzene] (9CI) (CA INDEX NAME)

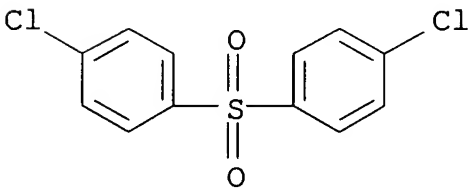
CM 1

CRN 1156-51-0
CMF C17 H14 N2 O2



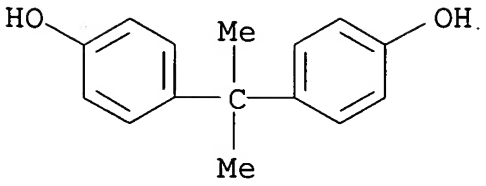
CM 2

CRN 80-07-9
CMF C12 H8 Cl2 O2 S



CM 3

CRN 80-05-7
CMF C15 H16 O2

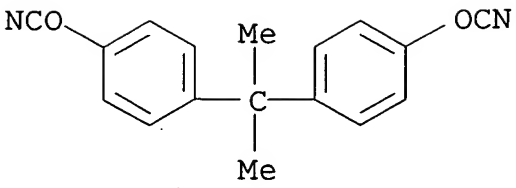


IT **279245-14-6**
(miscibility and kinetic behavior of cyanate resin/polysulfone blends)

L66 ANSWER 7 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
2000:302951 Document No. 133:74712 Effect of the cure temperature on the morphology of a cyanate ester resin modified with a thermoplastic: characterization by atomic force microscopy. Marieta, C.; del Rio, M.; Harismendy, I.; Mondragon, I. (Escuela Ingenieria Tecnica Industrial, Departmento Ingenieria Quimica y M. Ambiente, Universidad Pais Vasco/Euskal Herriko, San Sebastian/Donostia, 20011, Spain). European Polymer Journal, 36(7), 1445-1454 (English) 2000. CODEN: EUPJAG. ISSN: 0014-3057. Publisher: Elsevier Science Ltd..
AB A bisphenol A dicyanate (DCBA) resin was modified with bisphenol-A polysulfone (PSU) at a concn. of 15 wt.%. Mixts., postcured at the same conditions, were pre-cured at different temps. The effect of the curing temp. on the morphol. was studied by at. force microscopy (AFM). Also, SEM and AFM were compared in order to demonstrate that AFM is a powerful tool for the characterization of polymer mixt. morphol.
IT **279245-14-6**
(AFM vs. SEM characterization of cure temp. effect on morphol. of a cyanate ester resin modified with a thermoplastic)
RN 279245-14-6 HCAPLUS
CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer with 4,4'-(1-methylethylidene)bis[phenol] and 1,1'-sulfonylbis[4-chlorobenzene] (9CI) (CA INDEX NAME)

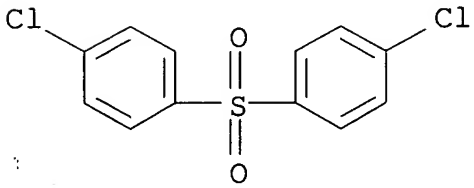
CM 1

CRN 1156-51-0
CMF C17 H14 N2 O2



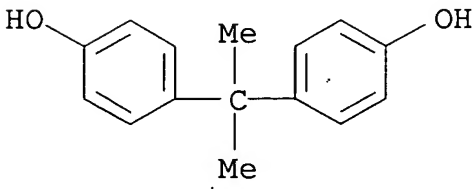
CM 2

CRN 80-07-9
CMF C12 H8 Cl2 O2 S



CM 3

CRN 80-05-7
CMF C15 H16 O2



IT **279245-14-6**
(AFM vs. SEM characterization of cure temp. effect on morphol. of a cyanate ester resin modified with a thermoplastic)

L66 ANSWER 8 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
1999:514529 Document No. 131:272202 Synthesis and characterization of new dicyanate monomers. A way to obtain fully aromatic crosslinked poly(ether ketone)s. Marcos-Fernandez, A.; Posadas, P.; Rodriguez, A.; Gonzalez, L. (Instituto de Ciencia y Tecnologia de Polimeros (CSIC), Madrid, E-28006, Spain). Journal of Polymer Science, Part A: Polymer Chemistry, 37(16), 3155-3168 (English) 1999. CODEN:

JPACEC. ISSN: 0887-624X. Publisher: John Wiley & Sons, Inc..

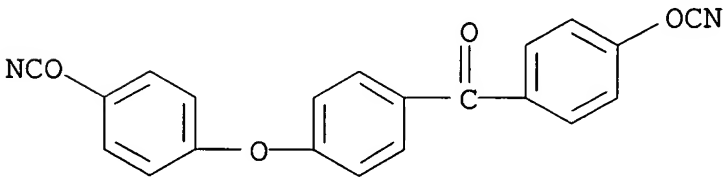
AB Several arom. mono- and dicyanate monomers bearing ether and ketone groups in the main chain have been synthesized through high-yield reactions widely used in org. chem. FT-IR and NMR were used to characterize these monomers and the intermediate products. The cyclotrimerization reaction was studied by DSC in monocyanate models, and the enthalpy of the reaction was detd. The value obtained was approx. 95 kJ/mol of cyanate irresp. of the substituent and symmetry of the substitution. For short dicyanates, cyclotrimerization did not reach completion, and for long dicyanates, the enthalpy of reaction could not be evaluated with accuracy. The resulting cured polycyanurates networks, due to the selectivity of the cyclotrimerization reaction, could be considered as true fully arom. crosslinked poly(ether ketone)s with controlled structure. Tg values of the networks were above 180.degree.. The higher values were found for shorter dicyanates and for monomers with para substitution. The 1% and 5% wt. loss values in nitrogen were above 310.degree. and 380.degree., resp., with char yields in the range 50-60%.

IT **213834-65-2P 213834-69-6P 213834-73-2P 213834-79-8P**
(synthesis and characterization of new dicyanate monomers to obtain fully arom. crosslinked poly(ether ketone)s)

RN 213834-65-2 HCAPLUS
CN Cyanic acid, 4-[4-(4-cyanatobenzoyl)phenoxy]phenyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

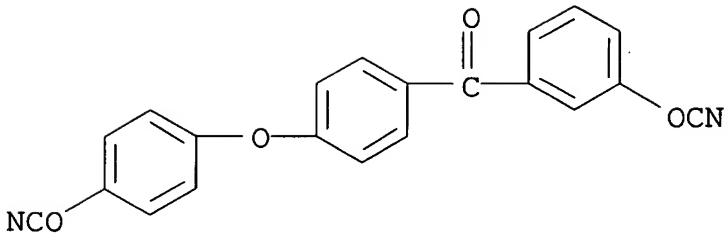
CRN 213834-05-0
CMF C21 H12 N2 O4



RN 213834-69-6 HCAPLUS
CN Cyanic acid, 4-[4-(3-cyanatobenzoyl)phenoxy]phenyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

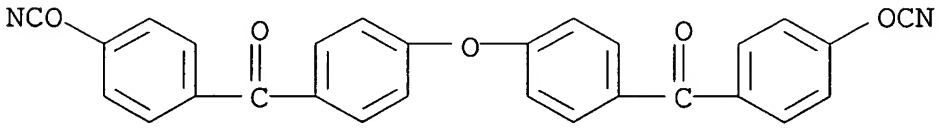
CRN 213834-13-0
CMF C21 H12 N2 O4



RN 213834-73-2 HCAPLUS
CN Cyanic acid, oxybis(4,1-phenylenecarbonyl-4,1-phenylene) ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

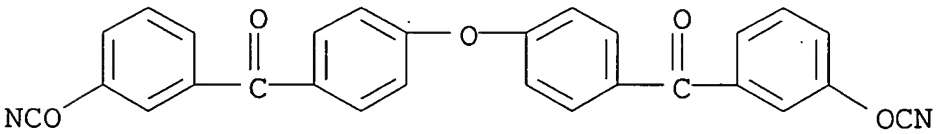
CRN 213834-22-1
CMF C28 H16 N2 O5



RN 213834-79-8 HCAPLUS
CN Cyanic acid, oxybis(4,1-phenylenecarbonyl-3,1-phenylene) ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 213834-28-7
CMF C28 H16 N2 O5



IT **213834-65-2P 213834-69-6P 213834-73-2P 213834-79-8P**
(synthesis and characterization of new dicyanate monomers to obtain fully arom. crosslinked poly(ether ketone)s)

L66 ANSWER 9 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
1998:659806 Document No. 130:4439 Polar interaction in a cyanated poly(ether sulfone)-modified polycyanurate. Chang, Jer-Yuan; Hong, Jin-Long (Department of Materials Science and Engineering, National Sun Yat-Sen University, Kaohsiung, 80424, Taiwan). Polymer, 39(26), 7119-7122 (English) 1998. CODEN: POLMAG. ISSN: 0032-3861. Publisher: Elsevier Science Ltd..

AB Low mol. wt. cyanated poly(ether sulfone) (CPES, Mn = 3200) was prepd., and cured with bisphenol A dicyanate (BPADCy). The resulting polycyanurates of different compns. show an S-shaped Tg-compn. curve. This unexpected S-shaped curve is interpreted in term of the polar interaction between poly(ether sulfone) and s-triazine rings formed by polycyclotrimerization of arom. dicyanates. Sep. study on u.v. spectra of mixt. model compds. suggests that this polar interaction belongs to an n-.pi.* interaction between the lone pair electrons of the N-atoms in the s-triazine ring and the .pi.*-orbital of the phenylene rings neighboring to the sulfone linkage. I.r. study on the cured polycyanurates indicates that this polar interaction causes the shift of the -C C=N stretching from 1564 to 1580 cm.

IT **152932-59-7P**
(polar interaction in a cyanated poly(ether sulfone) crosslinked with bisphenol A dicyanate)

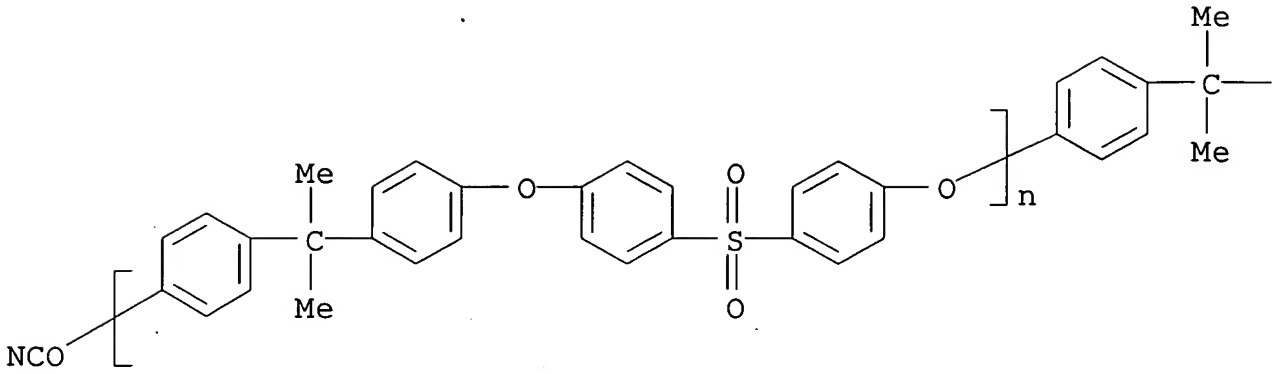
RN 152932-59-7 HCAPLUS

CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer with .alpha.-[4-[1-(4-cyanatophenyl)-1-methylethyl]phenyl]-.omega.-cyanatopoly[oxy-1,4-phenylenesulfonyl-1,4-phenyleneoxy-1,4-phenylene(1-methylethylidene)-1,4-phenylene] (9CI) (CA INDEX NAME)

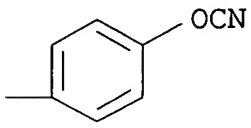
CM 1

CRN 118543-03-6
CMF (C27 H22 O4 S)n C17 H14 N2 O2
CCI PMS

PAGE 1-A



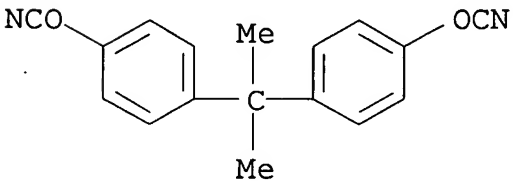
PAGE 1-B



Claim 26

CM 2

CRN 1156-51-0
CMF C17 H14 N2 O2



IT **152932-59-7P**
(polar interaction in a cyanated poly(ether sulfone) crosslinked with bisphenol A dicyanate)

L66 ANSWER 10 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
1998:531980 Document No. 129:276747 Synthesis and thermal characterization of a new family of crosslinked fully aromatic poly(ether ketone)s. Marcos-Fernandez, A.; Posadas, P.; Gonzalez, L.; Rodriguez, A. (Instituto de Cencia y Tecnologia de Polimeros (CSIC), Madrid, E-28006, Spain). Polymer Preprints (American

Chemical Society, Division of Polymer Chemistry), 39(2), 574-575 (English) 1998. CODEN: ACPPAY. ISSN: 0032-3934. Publisher: American Chemical Society, Division of Polymer Chemistry.

AB Cyanate-ester monomers contg. ether and ketone groups were synthesized; thermal curing of the monomers produces a thermoset material. The mechanism of cyanate-ester curing, the so-called cyclotrimerization, produces 1,3,5-S-triazine rings. Thus, the structure of the resulting thermoset is a fully arom. resin with ether and ketone groups linking the arom. rings. Polymers with comparable chem. and high temp. resistance to linear poly(ether ketone)s, but with a much lower processing temp. were prepd. using the cyclotrimerization route. The DSC data show the processing window for monomers and the TGA data are representative of formation of the polymers. To the crosslinked structure of the resulting polymers conveys better mech. properties above the glass transition, compared to linear poly(ether ketone)s.

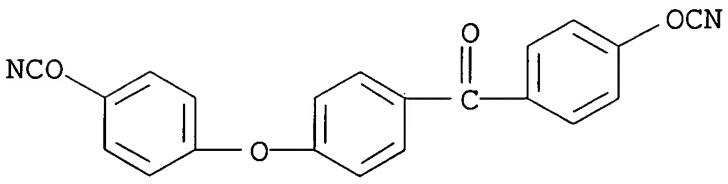
IT **213834-65-2P 213834-69-6P 213834-73-2P 213834-79-8P**
(prepn. and thermal cyclotrimerization of cyanate esters to obtained crosslinked fully arom. poly(ether ketone)s)

RN 213834-65-2 HCAPLUS

CN Cyanic acid, 4-[4-(4-cyanatobenzoyl)phenoxy]phenyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 213834-05-0
CMF C21 H12 N2 O4

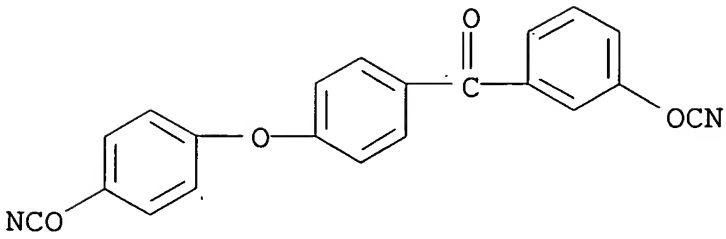


RN 213834-69-6 HCAPLUS

CN Cyanic acid, 4-[4-(3-cyanatobenzoyl)phenoxy]phenyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

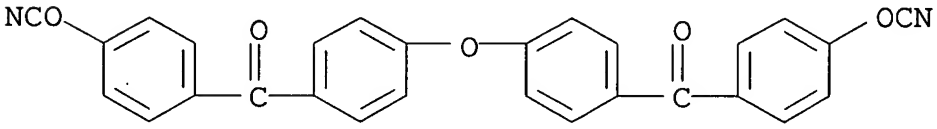
CRN 213834-13-0
CMF C21 H12 N2 O4



RN 213834-73-2 HCAPLUS
CN Cyanic acid, oxybis(4,1-phenylenecarbonyl-4,1-phenylene) ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

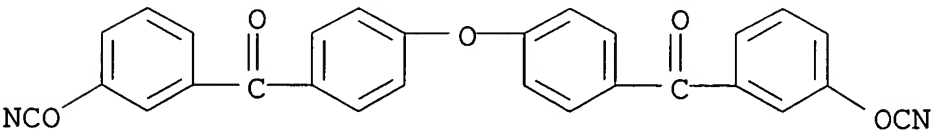
CRN 213834-22-1
CMF C28 H16 N2 O5



RN 213834-79-8 HCAPLUS
CN Cyanic acid, oxybis(4,1-phenylenecarbonyl-3,1-phenylene) ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 213834-28-7
CMF C28 H16 N2 O5



IT **213834-65-2P 213834-69-6P 213834-73-2P 213834-79-8P**
(prepn. and thermal cyclotrimerization of cyanate esters to obtained crosslinked fully arom. poly(ether ketone)s)

L66 ANSWER 11 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN

1998:502524 Document No. 129:109944 Poly(imide-carbonate)-based laminate. Tsuji, Hiroyuki; Hara, Shoji; Nagano, Hirosaku (Kanegafuchi Kagaku Kogyo K. K., Japan). U.S. US 5759693 A 19980602, 7 pp., Cont.-in-part of U. S. 5,641,852. (English). CODEN: USXXAM. APPLICATION: US 1997-811366 19970310. PRIORITY: JP 1995-19657 19950111; US 1996-586464 19960111.

AB The laminate is to solve a problem of bending of laminate caused by hardening contraction of epoxy resin that was a subject in laminate used conventional epoxy resinous compn. in laminate of .gtoreq.2 layers used for elec. and electronic parts, and to provide a novel laminate obtaining excellent adhesive property and heat resistant property, and exhibiting no bending. The laminate comprises laminating .gtoreq.2 components of (a) a resin compn. comprising a thermosetting resin of an imidocarbonate resin synthesized by reacting a cyanate resin and a compd. which contains .gtoreq.1 phenolic OH, and an epoxy resin (b) a heat-resistant resin having a glass transition temp. .gtoreq.150.degree. and a thermal expansion coeff. 0.4-3.8 .times. 10-5 cm/cm/.degree.C. at the temp. of 20-150.degree., wherein the inventive thermosetting resin compn. was consummated by converting cyanate resin into imide carbonate under the presence of the epoxy resin. Thus, tetramethylbisphenol F dicyanate (M 30) 40, bisphenol A 20, Epikote 828 20 and MEK 40 parts were heated at 80.degree. for 4 h, followed by adding 40 parts MEK to obtain a compn., 50 parts of which was blended with 20 parts Epikote 1001 and 50 parts MEK to give a compn. showing good dimensional stability and adhesion to Apical film.

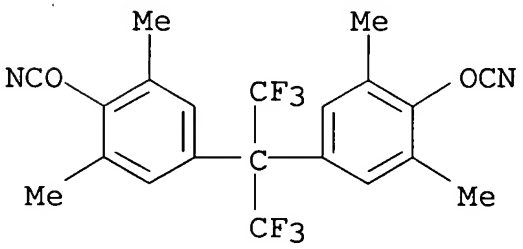
IT **181305-06-6P**
(poly(imide-carbonate)-based laminate)

RN 181305-06-6 HCAPLUS

CN Cyanic acid, [2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis(2,6-dimethyl-4,1-phenylene) ester, polymer with 4,4'-(1-methylethylidene)bis[phenol] (9CI) (CA INDEX NAME)

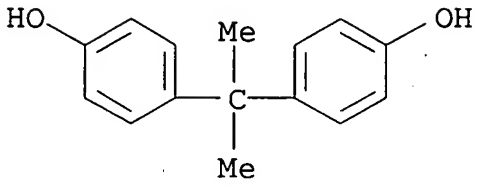
CM 1

CRN 181305-05-5
CMF C21 H16 F6 N2 O2



CM 2

CRN 80-05-7
CMF C15 H16 O2



IT **181305-06-6P**
(poly(imide-carbonate)-based laminate)

L66 ANSWER 12 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
1997:227564 Document No. 126:293637 Synthesis and characterization of new phosphorus and other heteroatom containing aryl cyanate ester monomers and networks. Abed, J. C.; Mercier, R.; McGrath, J. E. (Hoechst-Celanese Co., Charlotte, NC, USA). Journal of Polymer Science, Part A: Polymer Chemistry, 35(6), 977-987 (English) 1997. CODEN: JPACEC. ISSN: 0887-624X. Publisher: Wiley.

AB Several arom. dicyanate monomers have been synthesized bearing para-linked strong electron withdrawing groups, such as phenylphosphine oxide, sulfone, and carbonyl. These groups increased the reactivity of the cyanate functional groups and eliminated the need for curing catalysts. However, an undesirable decrease in the processing window between the monomer m.p. and the onset of cure was also generally obsd. An arylene ether Ph phosphine oxide system was designed that displayed several attractive characteristics such as a low softening point, a wide processing window, cure with no catalyst, high Tg and high char yield in air, suggesting that these new thermosets might show good fire resistance. The dicyanate ester monomers were synthesized in high yield by reacting various bisphenols with cyanogen bromide in the presence of triethylamine. The reactivity of the cyanate functional groups required that the cyanation reaction be conducted at temp. below 0.degree. to prevent imidocarbonate side reactions. Proton-NMR and FRIR were used to characterize these monomers. The cyclotrimerization curing process was monitored by their disappearance of the carbon-nitrogen triple bond stretch (2270 cm-1). An optimal cure schedule was detd. and the cured polycyanurate networks were characterized by DSC, DMTA, and TGA. Tg values were typically >250.degree. and 5% wt. loss values were obsd. by TGA in air above 400.degree.. Several of the dicyanate monomers with sufficiently large processing windows were cured into single

lap-shear adhesive bonds onto titanium 6/4 and the measurements are reported herein.

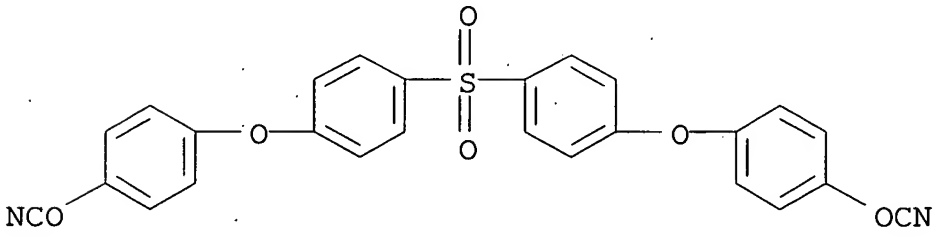
IT **42751-92-8P 189182-57-8P 189182-58-9P**
(in synthesis of new phosphorus and other heteroatom contg. aryl cyanate ester monomers and networks)

RN 42751-92-8 HCAPLUS

CN Cyanic acid, sulfonylbis(4,1-phenyleneoxy-4,1-phenylene) ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 42592-24-5
CMF C26 H16 N2 O6 S

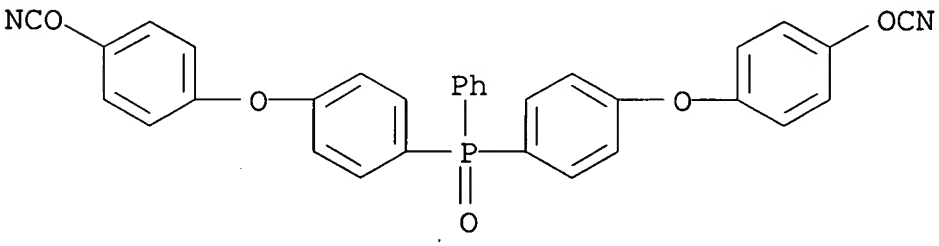


RN 189182-57-8 HCAPLUS

CN Cyanic acid, (phenylphosphinylidene)bis(4,1-phenyleneoxy-4,1-phenylene) ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 189182-55-6
CMF C32 H21 N2 O5 P

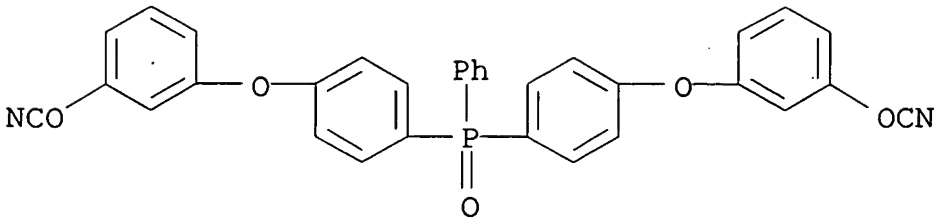


RN 189182-58-9 HCAPLUS

CN Cyanic acid, (phenylphosphinylidene)bis(4,1-phenyleneoxy-3,1-phenylene) ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 189182-56-7
CMF C32 H21 N2 O5 P



IT **42751-92-8P 189182-57-8P 189182-58-9P**
(in synthesis of new phosphorus and other heteroatom contg. aryl cyanate ester monomers and networks)

L66 ANSWER 13 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
1997:193525 Document No. 126:239045 Amorphous phenolphthalein-based poly (arylene ether)-modified cyanate ester networks: effect of thermal cure cycle on morphology and toughenability. Srinivasan, S. A.; Mcgrath, J. E. (Department of Chemistry and National Science Foundation Science and Technology Center: High Performance Polymeric Adhesives and Composites, Virginia Polytechnic Institute and State University, Blackburg, VA, 24061-0344, USA). Journal of Applied Polymer Science, 64(1), 167-178 (English) 1997. CODEN: JAPNAB. ISSN: 0021-8995. Publisher: Wiley.

AB Reactive functional thermoplastic poly(arylene ether) toughness modifiers enhance the toughness of brittle thermosetting cyanate ester [Arocy B-10] networks and also allow retention of highly desirable stability to solvent stress cracking and a moderately high modulus. Careful control of the heterophase morphol. structure was necessary to achieve significant toughening. In contrast to the well-defined morphologies of the reactive thermoplastic-modified networks, the use of nonreactive simple phys. blend modifiers of the same mol. wt. and backbone chem. produced a macrophase sepn. and no apparent control over the sizes of the phase-sepd. domains. Macrophase-sepd. morphologies are inherently process-sensitive and less desirable from the point of performance control and prediction. Generation of controlled microphase-sepd. morphologies can be achieved by systematically varying thermal cure cycles in the case of the reactive thermoplastic-modified systems. Such a cure cycle dependence of the morphol. was particularly demonstrated for the case of the 25% 15,000 < Mn > (15K) phenolphthalein-based hydroxy-functionalized poly(arylene ether sulfone) (PPH-PSF-OH)-modified networks. Morphologies that exhibit finer textures of the phase sepd. domains usually result in lower fracture

toughness values.

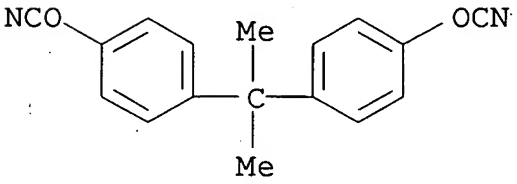
IT **188585-63-9P**
(thermal cure cycle and morphol. and toughness of cyanate ester-phenolphthalein-poly(arylene ether sulfone) copolymers)

RN 188585-63-9 HCAPLUS

CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer with 3,3-bis(4-hydroxyphenyl)-1(3H)-isobenzofuranone and 1,1'-sulfonylbis[4-fluorobenzene] (9CI) (CA INDEX NAME)

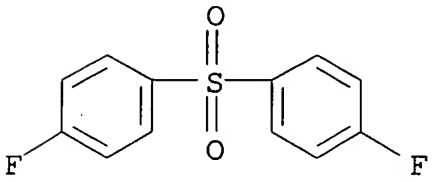
CM 1

CRN 1156-51-0
CMF C17 H14 N2 O2



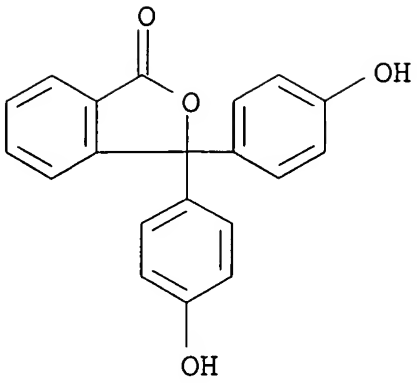
CM 2

CRN 383-29-9
CMF C12 H8 F2 O2 S



CM 3

CRN 77-09-8
CMF C20 H14 O4



IT **188585-63-9P**
(thermal cure cycle and morphol. and toughness of cyanate ester-phenolphthalein-poly(arylene ether sulfone) copolymers)

L66 ANSWER 14 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
1996:583580 Document No. 125:197605 Low-shrinkage epoxy thermosetting resin compositions and their manufacture. Tsuji, Hiroyuki; Hara, Masayuki (Kanegafuchi Chemical Ind, Japan). Jpn. Kokai Tokkyo Koho JP 08188702 A2 19960723 Heisei, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1995-19657 19950111.

AB The compns. comprising (A) epoxy resins and (B-1) cyanate resins and compds. having .gtoreq.1 phenolic OH or (B-2) imidocarbonates, useful for adhesives, coatings, paints, sealing compns. for electronic parts, and solder resists, etc., are manufd. by reacting cyanate resins with compds. having .gtoreq.1 phenolic OH to obtain imidocarbonate resins in the presence or absence of epoxy resins, optionally followed by adding epoxy resins. Thus, tetramethylbisphenol F dicyanate 40, bisphenol A 20, Epikote 828 20 parts, and MEK 40 parts were heated at 80.degree. for 4 h, followed by adding 40 parts MEK to obtain a compn., 50 parts of which was blended with 20 parts Epikote 1001 and 50 parts MEK to give a compn. showing good dimensional stability and adhesion to Cu plates.

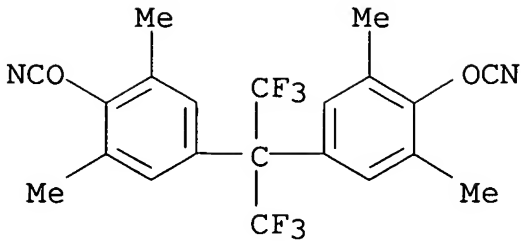
IT **181305-06-6P**
(manuf. of low-shrinkage epoxy thermosetting resin compns.)

RN 181305-06-6 HCAPLUS

CN Cyanic acid, [2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis(2,6-dimethyl-4,1-phenylene) ester, polymer with 4,4'-(1-methylethylidene)bis[phenol] (9CI) (CA INDEX NAME)

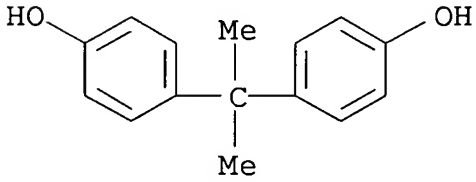
CM 1

CRN 181305-05-5
CMF C21 H16 F6 N2 O2



CM 2

CRN 80-05-7
CMF C15 H16 O2



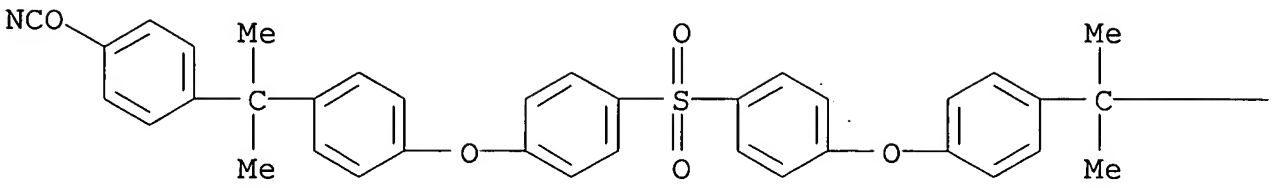
IT **181305-06-6P**
(manuf. of low-shrinkage epoxy thermosetting resin compns.)

L66 ANSWER 15 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
1996:199035 Document No. 124:262359 Molecular modeling of the physical and mechanical properties of two polycyanurate network polymers. Hamerton, Ian; Heald, C. Richard; Howlin, Brendan J. (Dep. Chemistry, Univ. Surrey, Surrey, GU2 5XH, UK). Journal of Materials Chemistry, 6(3), 311-14 (English) 1996. CODEN: JMACEP. ISSN: 0959-9428. Publisher: Royal Society of Chemistry.
AB Elastic moduli and glass transition temps. (Tgs) of two polycyanurates, based on the dicyanates of bisphenol A and an oligomeric poly(arylene ether sulfone), have been predicted from mol. simulation. The simulated mech. and phys. parameters offer reasonable agreement with the exptl. values. This is one of the first preliminary reports of the prediction of properties of a network polymer.
IT **175446-70-5**
(mol. modeling of the phys. and mech. properties of two polycyanurate network polymers)
RN 175446-70-5 HCAPLUS
CN Cyanic acid, sulfonylbis[4,1-phenyleneoxy-4,1-phenylene(1-methylethylidene)-4,1-phenylene] ester, homopolymer (9CI) (CA INDEX NAME)

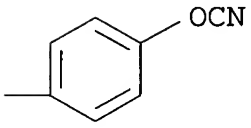
CM 1

CRN 175446-69-2
CMF C44 H36 N2 O6 S

PAGE 1-A



PAGE 1-B



IT **175446-70-5**
(mol. modeling of the phys. and mech. properties of two polycyanurate network polymers)

L66 ANSWER 16 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
1994:657047 Document No. 121:257047 High performance polycyanurate thermosets. Hedrick, Jeffrey C.; Viehbeck, Alfred; Gotro, Jeffrey T. (T.J. Watson Res. Cent., IBM Res. Div., Yorktown Heights, NY, 10598, USA). Polymer Preprints (American Chemical Society, Division of Polymer Chemistry), 35(1), 537-8 (English) 1994. CODEN: ACPPAY. ISSN: 0032-3934.

AB A fluorine-contg. polycyanurate thermoset was toughened with a fluorine-contg. poly(arylene ether sulfone). The enhanced toughness was achieved without sacrificing the high temp. performance of the unmodified network.,. The fracture and mech. properties of the crosslinked network are described and discussed.

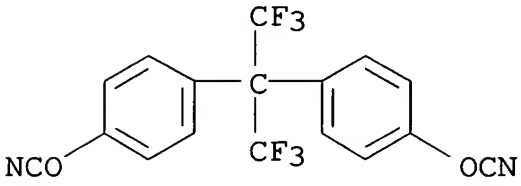
IT **158717-84-1P**
(crosslinked; prepn. and characterization of toughened polycyanurate thermosets)

RN 158717-84-1 HCAPLUS

CN Cyanic acid, [2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]di-4,1-phenylene ester, polymer with 1,1'-sulfonylbis[4-chlorobenzene] and 4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis[phenol] (9CI) (CA INDEX NAME)

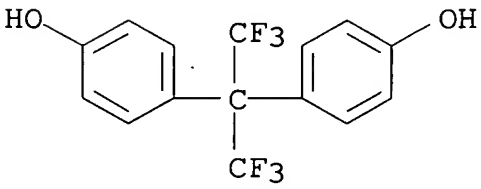
CM 1

CRN 32728-27-1
CMF C17 H8 F6 N2 O2



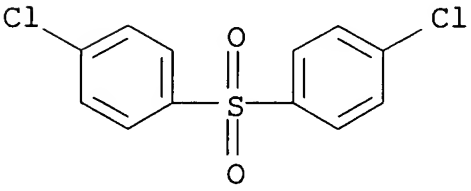
CM 2

CRN 1478-61-1
CMF C15 H10 F6 O2



CM 3

CRN 80-07-9
CMF C12 H8 Cl2 O2 S



IT **158717-84-1P**
(crosslinked; prepn. and characterization of toughened polycyanurate thermosets)

L66 ANSWER 17 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
1994:511037 Document No. 121:111037 Polytriazine-based composites for electric packagings and their manufacture. (International Business Machines Corp., USA). Jpn. Kokai Tokkyo Koho JP 06085107 A2 19940325 Heisei, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1993-2259 19930111. PRIORITY: US 1992-848772 19920310.

AB The composites, with low dielec. const. and good workability, comprise a thermoplastic filler (e.g., Upilex S)-contg. polytriazine [e.g., 1,3,5-triazine-2,4,6-triyltris[oxy-4,1-phenylene[2,2,2-trifluoro-1-(tri fluoromethyl)ethylidene]-4,1-phenylene] ester homopolymer] core and .gtoreq.1 an elec. conductive surface layer (e.g., Cu).

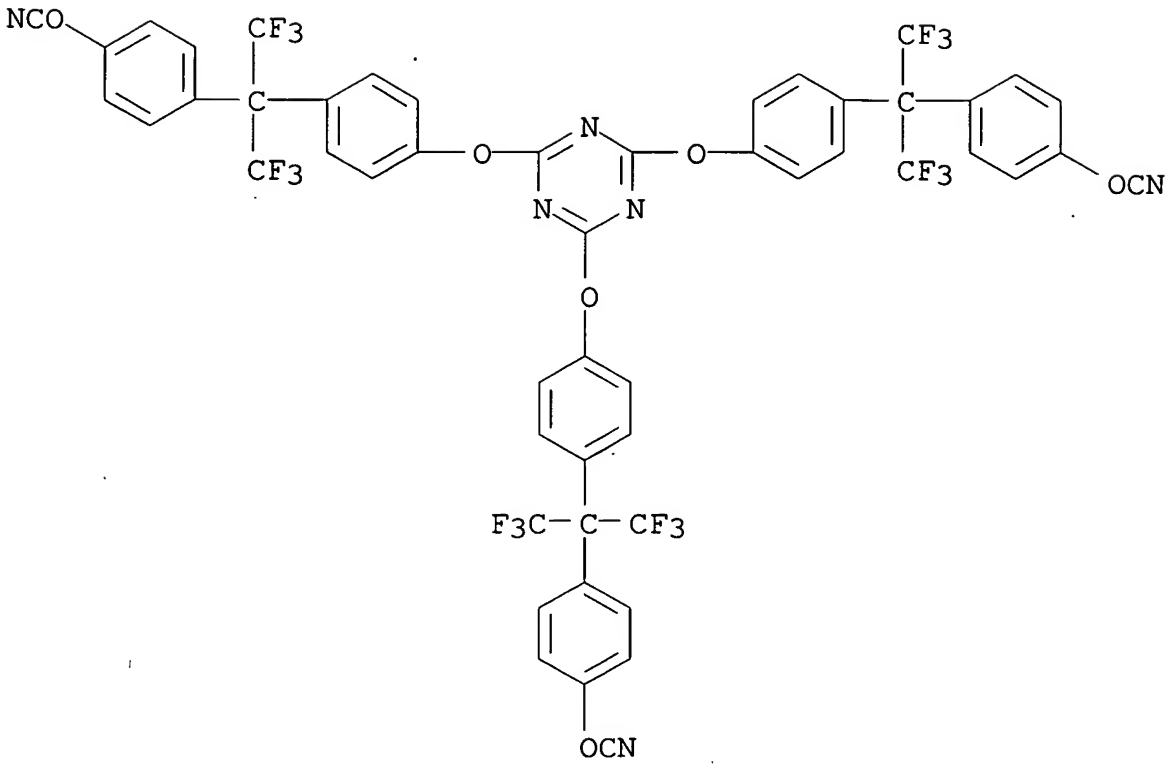
IT **157096-21-4**
(thermoplastic particle-contg., laminated with elec. conductive layers, for elec. circuits)

RN 157096-21-4 HCAPLUS

CN Cyanic acid, 1,3,5-triazine-2,4,6-triyltris[oxy-4,1-phenylene[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]-4,1-phenylene] ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 139664-42-9
CMF C51 H24 F18 N6 O6



IT **157096-21-4**
(thermoplastic particle-contg., laminated with elec. conductive layers, for elec. circuits)

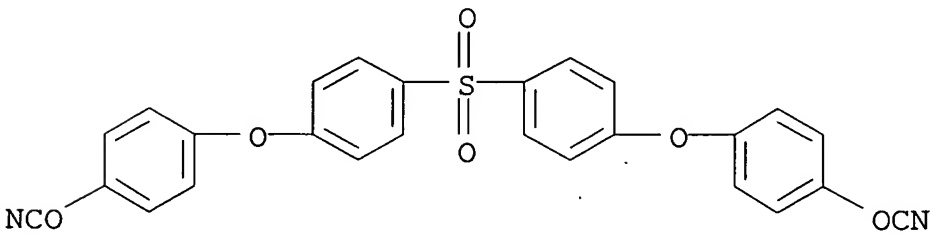
L66 ANSWER 18 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
1994:135811 Document No. 120:135811 Synthesis of novel monomers for cyanate ester matrixes. Abed, J. C.; Mercier, R.; Srinivasan, S. A.; McGrath, J. E. (Dep. Chem., Virginia Polytech. Inst. and State Univ., Blacksburg, VA, 24061-0212, USA). Polymer Preprints (American Chemical Society, Division of Polymer Chemistry), 33(2), 233-4 (English) 1992. CODEN: ACPPAY. ISSN: 0032-3934.

AB Several dicyanate monomers, e.g., bis(4-cyanatophenyl)phenylphosphine oxide, bis(4-cyanatophenoxy)phenyl sulfone, bis(4-cyantophenyl) sulfone, 1,1-bis(4-cyanatophenyl)-1-phenyl-2,2,2-trifluoroethane, and 4,4'-dicyanatobenzophenone, were prepd. and their resp. polycyanurate resins were characterized by 1H NMR, FTIR and thermal anal. The cure degree of the polycyanurate resins was >95%. Interesting trends were obsd. between the processing windows of the resins and the electron withdrawing ability of the dicyanate monomers. The phenylphosphine oxide structure exhibited good thermooxidative properties and gave superior char yields.

IT **42751-92-8P**
(prepn. and thermal properties of triazine group-contg.)
RN 42751-92-8 HCAPLUS
CN Cyanic acid, sulfonylbis(4,1-phenyleneoxy-4,1-phenylene) ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 42592-24-5
CMF C26 H16 N2 O6 S



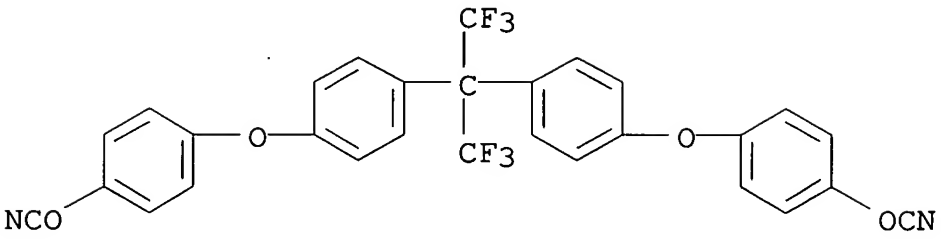
IT **42751-92-8P**
(prepn. and thermal properties of triazine group-contg.)

L66 ANSWER 19 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
1994:109005 Document No. 120:109005 Thermosetting resin compositions for manufacture of laminates and their uses. Suzuki, Masahiro; Nagai, Akira; Nishimura, Shin; Amo, Satoru; Kawai, Yoshinori; Takahashi, Akio (Hitachi Ltd, Japan). Jpn. Kokai Tokkyo Koho JP 05078446 A2 19930330 Heisei, 11 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1991-237834 19910918.
AB The title compns., useful for manuf. of laminates, elec. insulators, elec. circuit boards, microchip carriers, etc., comprise F-contg. cyanates, and .gtoreq.1 compd. selected from cyanamides, maleimides, epoxy compds., vinyl compds., and poly(p-hydroxystyrene) or its derivs. Thus, refluxing 2,2-bis[4-(4-cyanatophenoxy)phenyl]-1,1,1,3,3,3-hexafluoropropane 80, 1-perfluorononenyloxy-3,5-phthaloylbis[4-(4-cyanamidophenoxy)phenyl] 10, and DER 323 (epoxy resin) 10 g in Me iso-Bu ketone gave a prepolymer, which was compression molded to give a sheet having thermal expansion coeff. 7.9 .times. 10-5/K, decompn. temp. 378.degree., and relative dielec. const. 2.9 at 1 MHz.
IT **151704-55-1**
(thermosetting, for laminates for elec. circuit boards and elec. insulators)
RN 151704-55-1 HCAPLUS
CN Cyanic acid, [2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]bis(4,1-phenyleneoxy-4,1-phenylene) ester, homopolymer (9CI) (CA INDEX

NAME)

CM 1

CRN 151704-54-0
CMF C29 H16 F6 N2 O4



IT **151704-55-1**
(thermosetting, for laminates for elec. circuit boards and elec. insulators)

L66 ANSWER 20 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
1994:108429 Document No. 120:108429 Effect of backbone chemistry and functional termination on the miscibility/phase behavior in blends of bisphenol A-based cyanate ester resin systems with controlled molecular weight cyanate ester functionalized poly(arylene ether sulfones). Srinivasan, S. A.; Abed, J. C.; McGrath, J. E. (Dep. Chem., Virginia Polytech. Inst. and State Univ., Blacksburg, VA, 24061-0212, USA). Polymer Preprints (American Chemical Society, Division of Polymer Chemistry), 33(2), 325-6 (English) 1992. CODEN: ACPPAY. ISSN: 0032-3934.

AB 2,2'-Bis(4-cyanatophenyl)propane resin underwent crosslinking with cyanate-terminated arom. polyether-polysulfones to yield modified networks. Impact resistance of the crosslinked networks was significantly improved by doping with a polyether-polyketone homopolymer.

IT **152932-59-7P**
(prepn. and impact-resistance of, effect of polyether-polyketone dopants on)

RN 152932-59-7 HCAPLUS

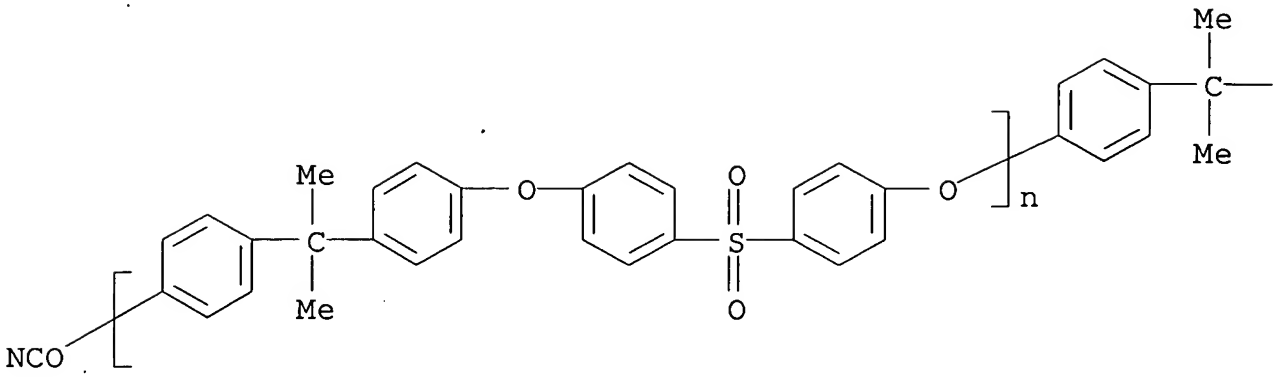
CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer with .alpha.-[4-[1-(4-cyanatophenyl)-1-methylethyl]phenyl]-.omega.-cyanatopoly[oxy-1,4-phenylenesulfonyl-1,4-phenyleneoxy-1,4-phenylene(1-methylethylidene)-1,4-phenylene] (9CI) (CA INDEX NAME)

CM 1

CRN 118543-03-6

CMF (C27 H22 O4 S)n C17 H14 N2 O2
CCI PMS

PAGE 1-A



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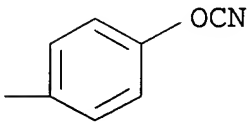
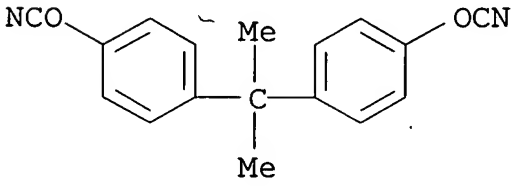


CM 2

CRN 1156-51-0
CMF C17 H14 N2 O2



IT **152932-59-7P**
(prepn. and impact-resistance of, effect of polyether-polyketone dopants on)

L66 ANSWER 21 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
1992:427791 Document No. 117:27791 Catalysis and kinetics of cyclotrimerization of cyanate ester resin systems. Osei-Owusu, A.;

Martin, G. C.; Gotro, J. T. (Dep. Chem. Eng. Mater. Sci., Syracuse Univ., Syracuse, NY, 13244, USA). Polymer Engineering and Science, 32(8), 535-41 (English) 1992. CODEN: PYESAZ. ISSN: 0032-3888.

AB The kinetics of cyclotrimerization and the thermal stability of bisphenol A-based cyanate ester resin systems were detd. using Fourier transform IR spectroscopy, DSC, and thermogravimetry. The bisphenol A dicyanate was cured with 4 phr nonylphenol and with the Zn and Mn octoates, and cobalt acetylacetonate at concns. ranging from 0 to 750 ppm metal. An empirical rate law was used to predict the cyanate concn. profiles. The obsd. reaction rate showed a first-order dependence on the initial metal concn. and a second-order dependence on the cyanate concn. in the kinetically controlled regime. For the uncatalyzed systems, the kinetics was described by a second-order autocatalytic model. The thermal stability of the network was dependent on the catalyst concn. for the Zn catalysts. For the samples cured with Mn, no effect of concn. on the thermal stability was obsd.

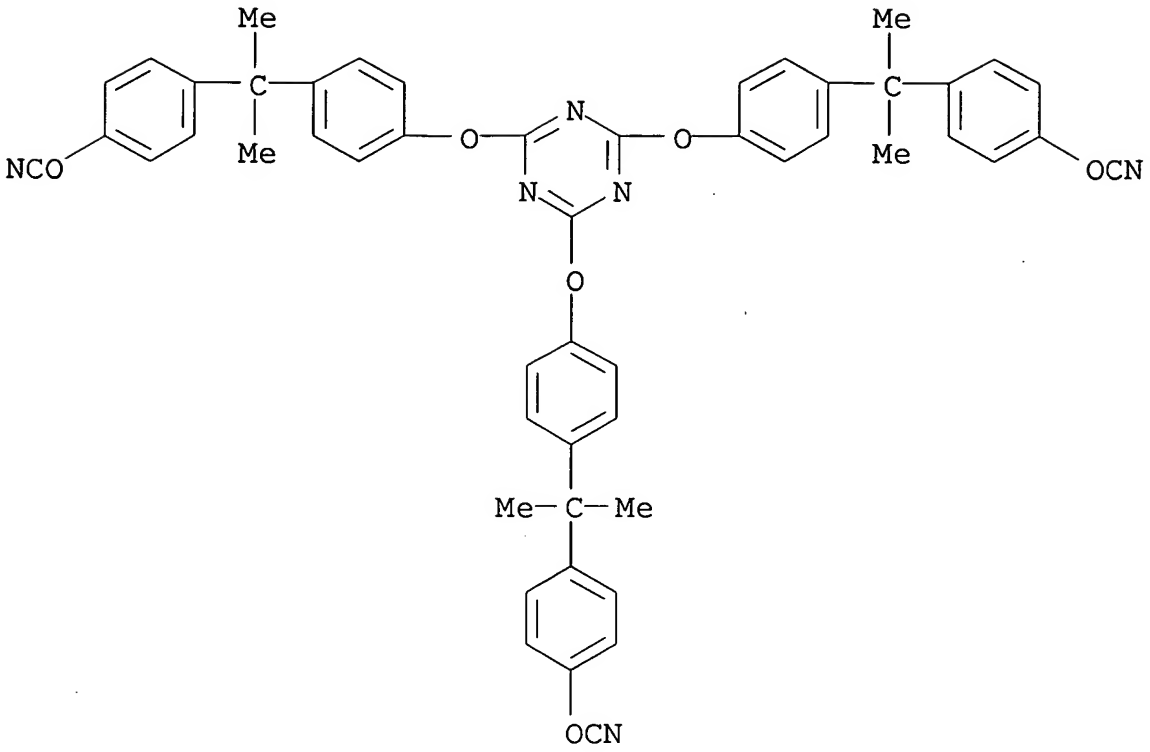
IT **142175-27-7P**
(prepn. and metal-catalyzed curing of)

RN 142175-27-7 HCAPLUS

CN Cyanic acid, 1,3,5-triazine-2,4,6-triyltris[oxy-4,1-phenylene(1-methylethylidene)-4,1-phenylene] ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 138024-16-5
CMF C51 H42 N6 O6



IT **142175-27-7P**
(prepn. and metal-catalyzed curing of)

L66 ANSWER 22 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
1990:78669 Document No. 112:78669 Thermosetting mixtures of thermoplastics and aromatic cyanate esters. Gerth, Dale; Ittemann, Peter; Tesch, Helmut (BASF A.-G., Fed. Rep. Ger.). Ger. Offen. DE 3802979 A1 19890810, 6 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1988-3802979 19880202.

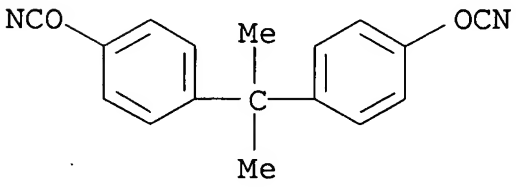
AB The title compns., giving moldings with good toughness, stiffness, and heat resistance, contain polyfunctional, arom. cyanate esters 100, monofunctional, arom. cyanate esters 2-50, thermoplastics 5-60, bismaleimides 0-50, and epoxy resins 0-30 parts. A soln. of bisphenol A dicyanate (I) 350, 4-biphenylyl cyanate 50, and a polysulfone [bisphenol A-bis(4-chlorophenyl) sulfone copolymer, mol. wt. 12,000] 100 g was mixed with 0.93 g nonylphenol and 0.31 g 0.1% Cu naphthenate soln. and heated in a mold for 2 h at 120.degree., 2 h at 180.degree., and 4 h at 210.degree. to give a molding with glass temp. 280.degree., elastic modulus 4217 N/mm2, and fracture energy 301 J/m2; vs. 271, 4160, and 243, resp., for a 320:80 I-polysulfone mixt.

IT **125223-86-1P**
(moldings, manuf. of, with good toughness and stiffness)

RN 125223-86-1 HCAPLUS
CN Cyanic acid, (1-methylethylidene)di-4,1-phenylene ester, polymer with [1,1'-biphenyl]-4-yl cyanate, 4,4'-(1-methylethylidene)bis[phenol] and 1,1'-sulfonylbis[4-chlorobenzene] (9CI) (CA INDEX NAME)

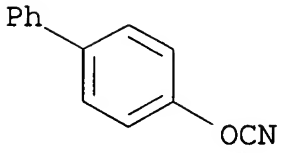
CM 1

CRN 1156-51-0
CMF C17 H14 N2 O2



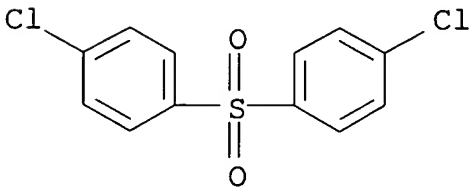
CM 2

CRN 1137-82-2
CMF C13 H9 N O



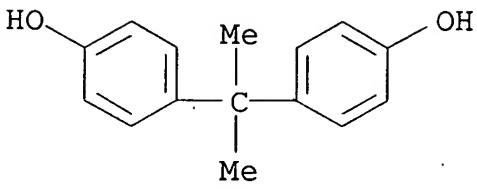
CM 3

CRN 80-07-9
CMF C12 H8 Cl2 O2 S



CM 4

CRN 80-05-7
CMF C15 H16 O2



IT **125223-86-1P**
(moldings, manuf. of, with good toughness and stiffness)

L66 ANSWER 23 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
1976:478980 Document No. 85:78980 s-Triazine prepolymers. Sundermann, Rudolf (Bayer A.-G., Fed. Rep. Ger.). Ger. Offen. DE 2457154 19760610, 23 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1974-2457154 19741204.

AB Prepolymers useful in the prepn. of glass fiber laminates with reduced heat evolution and shrinkage are prepd. by reaction of arom. polyols with 0.01-0.5 mole dichloro-s-triazine per OH group and conversion of OH to cyanate groups with cyanogen halides and bases. Thus, dropwise addn. of 20.2 g Et3N in 50 ml Me2CHOH to 18 g 2,4-dichloro-6-methoxy-s-triazine and 45.6 g bisphenol A in 200 ml Me2CHOH stirred at 30-40.degree., refluxing 6 hr, filtering, concg., and stirring the product in 200 ml AcNMe2 with 13.5 g ClCN [506-77-4] at 0.degree. while adding 20.2 g Et3N dropwise gives 57 g NCO-terminated prepolymer [60020-96-4], which is heated 5 hr at 160.degree. to give a high-mol. wt. polytriazine.

IT **60015-10-3P**
(prepn. of)

RN 60015-10-3 HCAPLUS

CN Poly[(6-methyl-1,3,5-triazine-2,4-diyl)oxy-1,4-phenylene(1-methylethylidene)-1,4-phenyleneoxy], .alpha.-[4-[1-(4-cyanatophenyl)-1-methylethyl]phenoxy]-.omega.-cyano- (9CI) (CA INDEX NAME)

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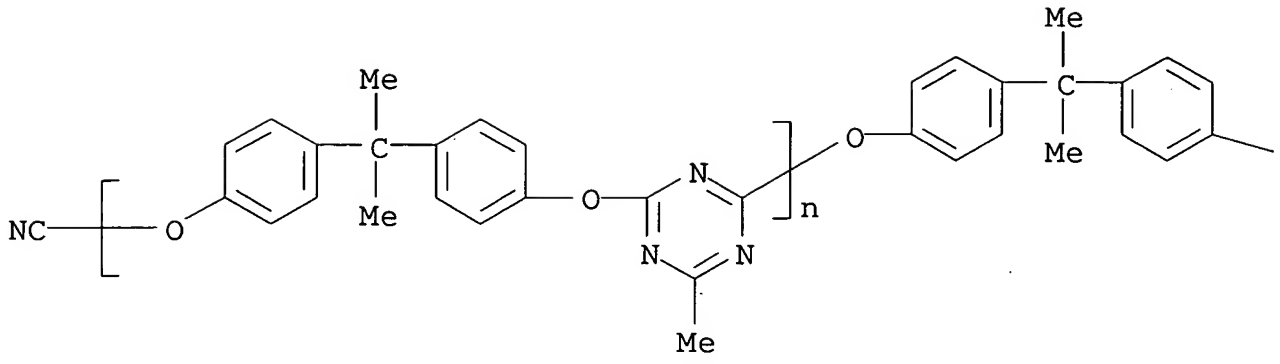

↑ consistent with the "proviso" of claim 21

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OCN

IT **60015-10-3P**
(prepn. of)

L66 ANSWER 24 OF 24 HCAPLUS COPYRIGHT 2005 ACS on STN
1973:454306 Document No. 79:54306 Cyanurates of cyanatophenyl-terminated poly(arylene ethers). Loudas, Basil L.; Vogel, Herward A. (Minnesota Mining and Manufacturing Co.). U.S. US 3738962 19730612, 6 pp. Division of U.S. 3,595,900. (English). CODEN: USXXAM. APPLICATION: US 1971-122142 19710308.

AB Cyanatophenyl terminated linear polyphenyl ether derivs. contg. .geq.3 phenyl residues were thermally polymd. to form polyphenylene ether cyanurate polymers linked by .geq.3 phenylene nuclei which are linked by O. These polymers are readily fabricated in the form of shaped articles having good flexibility, strength, and toughness. For example, a mixt. of 0.53 mole cyanogen bromide and 0.25 mole p-C6H4(O6H4OH-p)2 in Me2CO was treated with NEt3 to give 1,4-bis(p-cyanophenoxy)benzene (I) [41476-29-3]. I was cured at 350.deg. for 1 hr to give an poly[1,4-bis(p-cyanatophenoxy)benzene] [35038-74-5] adhesive bond with overlap shear tensile strength (psi) of 4,400 at-67.deg.F and 3,000 at 250.deg. and curing at 300.deg. for 5 hr and 500 for 0.5 hr gave an impact strength of 1.6 ft. lbs.

IT **42751-83-7 42751-90-6 42751-91-7**
42751-92-8 42751-93-9

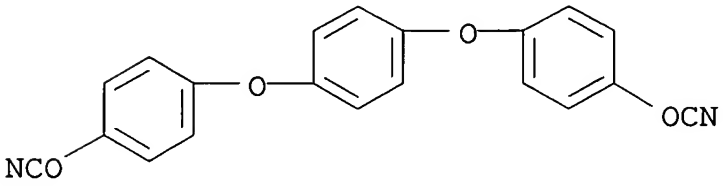
(triazine ring-contg., properties of)

RN 42751-83-7 HCAPLUS

CN Cyanic acid, 1,4-phenylenebis(oxy-4,1-phenylene) ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 34238-16-9
CMF C20 H12 N2 O4

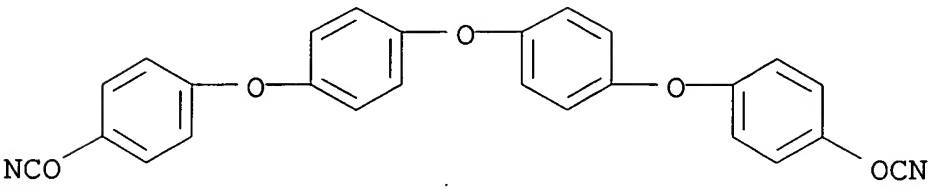


RN 42751-90-6 HCAPLUS

CN Cyanic acid, oxybis(4,1-phenyleneoxy-4,1-phenylene) ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 34018-54-7
CMF C26 H16 N2 O5

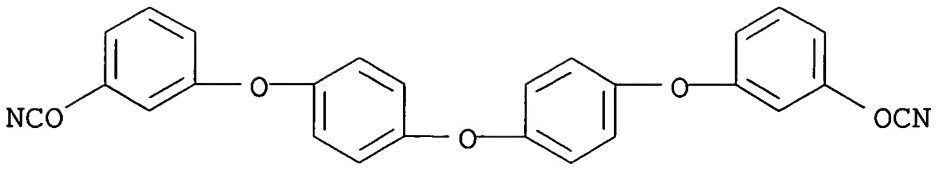


RN 42751-91-7 HCAPLUS

CN Cyanic acid, oxybis(4,1-phenyleneoxy-3,1-phenylene) ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

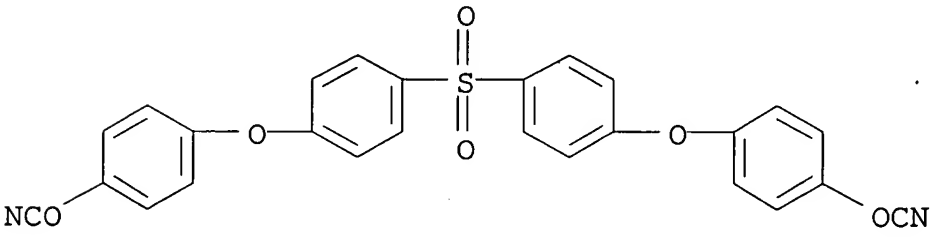
CRN 34238-17-0
CMF C26 H16 N2 O5



RN 42751-92-8 HCAPLUS
CN Cyanic acid, sulfonylbis(4,1-phenyleneoxy-4,1-phenylene) ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

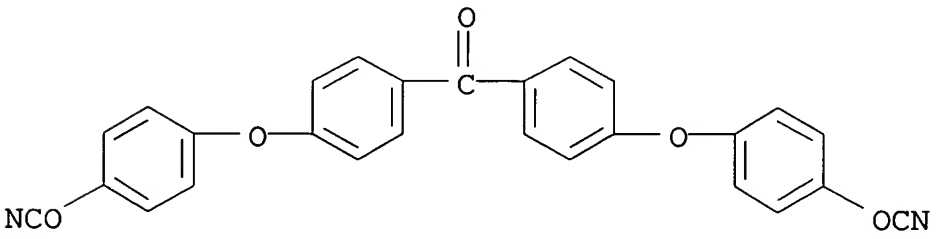
CRN 42592-24-5
CMF C26 H16 N2 O6 S



RN 42751-93-9 HCAPLUS
CN Cyanic acid, carbonylbis(4,1-phenyleneoxy-4,1-phenylene) ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 34238-18-1
CMF C27 H16 N2 O5



IT **42751-83-7 42751-90-6 42751-91-7 42751-92-8 42751-93-9**